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Environmental Challenges for the Nuclear Diagnostics on the NIF and LMJ

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The National Ignition Facility (NIF) and Laser Mega Joule (LMJ) facilities are currently under construction in the United States and France. Ignited targets at these facilities are anticipated to produce up to 10^{19} deuterium-tritium fusion neutrons. This will provide unprecedented opportunities and challenges for the use of nuclear diagnostics in inertial confinement fusion experiments. The NIF and LMJ nuclear diagnostics will work in a harsh radiation environment that includes neutron, hard x-ray, and gamma backgrounds, neutron induced signals in coaxial cables, and electromagnetic pulse (EMP) generated signals. Recent results of different background measurements on OMEGA laser facility will be reported. Based on these results, specific design concepts have been identified to mitigate much of the radiation and EMP-induced backgrounds. An overview of the background mitigation techniques in the NIF nuclear diagnostics conceptual designs will be presented.

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